



# **Courses Count: Preparing Students for Postsecondary Success**

ACT POLICY REPORT

**ACT**

## HIGH SCHOOL COURSES AND POSTSECONDARY READINESS

Many high school students and parents believe that simply meeting the number of credits required for graduation will provide adequate preparation for college (Venezia et al., 2003). Unfortunately, this assumption is incorrect. Students generally have multiple course options from which to choose to satisfy requirements and not all will suitably prepare them for postsecondary training. This is particularly true in mathematics and science (ACT, 2004b; Schmidt et al., 1997).

A recent ACT study identified the contribution that specific courses and course sequences made to college readiness. It found that taking the full course sequences typically considered college preparatory best prepared students for freshman-level college courses (Noble & Schmelker, in press). Highlights of this study are presented here.

### Background

ACT has identified college readiness benchmarks on the ACT Assessment<sup>1</sup> (ACT, 2003c) at which students have at least a 50 percent chance of earning a B or better and at least a 75–80 percent chance of earning a C or better in first-year, credit-bearing courses (Allen & Sconing, in press). An ACT English score of 18 is the college readiness benchmark for English Composition; an ACT Mathematics score of 22 is the benchmark for college Algebra; and an ACT Science score of 24 is the benchmark for college Biology. Using these benchmarks, we identified course sequences that increased the likelihood of students meeting the benchmarks.

Data from a subset of ACT test-takers who graduated in 2003 were used to explore the contribution of courses and course sequences to postsecondary readiness. The subset consisted of those students who took PLAN<sup>2</sup> (ACT, 2003b) during their sophomore year and the ACT Assessment during their junior or senior year. The total sample included 403,381 students from 10,792 high schools. To be sure that we identified the impact of courses and course sequences alone, we statistically controlled for students' prior achievement and the grade they were in when they took the ACT Assessment.

The Course Grade Information Section of the ACT Assessment provides information about students' coursework in 30 specific high school courses. Students are asked to indicate whether they have taken or are currently taking a particular course, or whether they plan to take it before graduating high school. Course sequences investigated in this study were based on previous research (Blank & Langesen, 2001; Campbell et al., 2000; National Research Council, 2002; Noble, Davenport, Schiel, & Pommerich, 1999; O'Sullivan, Reese, & Mazzeo, 1997).

<sup>1</sup> The ACT Assessment contains four curriculum-based tests: English, Mathematics, Reading, and Science. These standardized multiple-choice tests are based on major areas of high school and postsecondary instructional programs.

<sup>2</sup> Like the ACT Assessment, PLAN contains four curriculum-based, multiple-choice tests that measure student progress in English, mathematics, reading, and science. It is administered in grade 10.

Foreign language was included in the investigation to determine whether it contributed to ACT English scores and to the likelihood of meeting the English Composition benchmark, over and above the regular English coursework. Unlike courses in other disciplines, the Course Grade Information Section does not list specific courses within each language (e.g., introduction, first-year, second-year). Students report the number of languages (e.g., Spanish, French, German) they have studied or plan to study. Therefore, the contribution of foreign language is based on the number of languages studied rather than the number of courses taken or years studied in any one language.

### **Coursework, ACT English Scores, and the English Composition Benchmark**

Although taking English 9–11<sup>3</sup> was not associated with a meaningful increase in ACT English scores relative to taking fewer courses, taking one or more foreign languages over and above English 9–11 increased students' ACT English score by 1.1 points, compared to taking only English 9–11. Failure to find a significant ACT score increase associated with taking English 9–11 is likely due to the fact that very few students reported taking less than English 9–11 (1%).

The contribution of English 9–11 (versus taking less than this sequence) to meeting the English Composition benchmark could not be evaluated due to the limited number of students who did not take this sequence while scoring below the readiness benchmark (less than 1 percent of all students). However, students who took English 9–11 had a 78 percent chance of meeting the benchmark. Compared to taking only English 9–11, also taking one or more foreign languages was typically associated with a 9 percent increase in students' chances of meeting or exceeding the benchmark (to 87 percent).

### **Coursework, ACT Mathematics Scores, and the College Algebra Benchmark**

Figure 1 contains the results for the ACT Mathematics test. Seven mathematics course sequences were examined in total; students taking six course sequences were compared to students who took less than Algebra 1, Geometry, and Algebra 2. The average ACT Mathematics score of students taking less than Algebra 1, Geometry, and Algebra 2 was 16.7. Taking Algebra 1, Geometry, and Algebra 2 was associated with an average ACT Mathematics score of 17.8, an increase of 1.1 points for students taking less than these three courses. Taking either Trigonometry or other advanced mathematics,<sup>4</sup> in addition to these three courses, resulted in average ACT Mathematics scores of 18.8 and 19.3, respectively. Taking other advanced mathematics and Trigonometry increased ACT Mathematics scores by 3.1 points (to 19.8).

A relatively high average score (20.9 points) was associated with taking other advanced mathematics courses, Trigonometry, and Calculus, in addition to Algebra 1, Geometry, and Algebra 2. In a supplemental analysis, we found that

<sup>3</sup> English 12 was not included in the analysis because students who took the ACT Assessment as juniors would not have had the opportunity to participate in this course.

<sup>4</sup> Includes courses beyond Algebra 2 other than Trigonometry and Calculus.

students who took Physics, in addition to the six mathematics courses, had an even higher average ACT Mathematics score (21.2), compared to 16.7 for those who had taken less than Algebra 1, Geometry, and Algebra 2 (Figure 1).

Figure 2 illustrates students' chances of meeting the college Algebra benchmark associated with taking various mathematics course sequences, compared to taking less than Algebra 1, Geometry, and Algebra 2. Students taking less than Algebra 1, Geometry, and Algebra 2 had a 10 percent chance of meeting the college Algebra benchmark.

Taking Algebra 1, Geometry, and Algebra 2 was typically associated with a 22 percent chance of meeting the benchmark (an increase of 12 percent over that for students taking less than Algebra 1, Geometry, and Algebra 2). Taking upper-level mathematics courses beyond Algebra 2 was associated with substantial increases in students' chances of meeting or exceeding the college Algebra benchmark. Chances ranged from 34 percent (other advanced mathematics) to 58 percent (other advanced mathematics, Trigonometry, and Calculus), compared to 10 percent for those taking less than Algebra 1, Geometry, and Algebra 2. Students taking these various course sequences were about 2 to 5 times as likely as those taking less than Algebra 1, Geometry, and Algebra 2 to meet the benchmark.

Students taking Physics, in addition to Algebra 1, Geometry, Algebra 2, other advanced mathematics, Trigonometry, and Calculus, typically had a 64 percent chance of meeting the college benchmark (an increase of 54 percent over those taking less than Algebra 1, Geometry, and Algebra 2) (Figure 2). This increase was 6 percentage points higher than that associated with taking the six mathematics course sequence.

# The New SAT®: Fact Sheet

## Introduction Schedule:

Fall 2004 . . . . . PSAT/NMSOT®\*

\*Will reflect changes to the SAT, excluding the student-written essay.

March 2005 . . . . first administration of the new SAT

## Changes to the SAT are as follows:

### Writing

- A new writing section was added to the test. Students are asked to write an essay that requires them to take a position on an issue and use reasoning and examples to support their position.
- The essay is similar to the type of writing required on college essay exams.
- Multiple-choice questions measure a student's ability to identify sentence errors, improve sentences, and improve paragraphs.

### Math

- The new math section includes topics from third-year college-preparatory math, such as exponential growth, absolute value, functional notation, and negative and fractional exponents.

### Critical Reading:

- The critical reading section, formerly known as the verbal section, will include short and long reading passages.
- Analogies were eliminated, and sentence-completion questions will remain.

**Total Testing Time:** 3 hours and 45 minutes, including unscored 25-minute variable section (which helps in the development of future test questions).

## Section Overviews

Math	Current SAT	New SAT
Time	75 min. (Two 30-min. sections, one 15-min. section)	70 min. (Two 25-min. sections, one 20-min. section)
Content	Multiple-Choice Items Student-Produced Responses, and Quantitative Comparisons Measuring: Number and Operations Algebra I and Functions Geometry; Statistics, Probability, and Data Analysis	Multiple-Choice Items Student-Produced Responses Measuring: Number and Operations Algebra I, II, and Functions Geometry; Statistics, Probability, and Data Analysis
Score	M 200–800	M 200–800

Critical Reading	Current SAT	New SAT
Time	75 min. (Two 30-min. sections, one 15-min. section)	70 min. (Two 25-min. sections, one 20-min. section)
Content	Sentence Completions Passage-Based Reading Analogies Measuring: Extended Reasoning Literal Comprehension Vocabulary in Context	Sentence Completions Passage-Based Reading Measuring: Extended Reasoning Literal Comprehension Vocabulary in Context
Score	V 200–800	CR 200–800

Writing	Current SAT	New SAT
Time	No Test Currently	60 min. (35-min. multiple choice; 25-min. essay)
Content	No Test Currently	Multiple-Choice: Identifying Errors; Improving Sentences and Paragraphs Student-Written Essay: Effectively Communicate a Viewpoint, Defining and Supporting a Position
Proposed Score		W 200–800 Multiple-Choice Subscore: 20–80 Essay Subscore: 2–12

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